AMENDMENTS TO THE CLAIMS

Claim 1 (Currently Amended) An image reproduction apparatus including an ATS generation unit, an ATS multiplexing unit, channel reproduction units, a reproduction ATS generation unit, a reproduction timing generation unit, and a multiplexing unit, ~~wherein~~

wherein an[[a]] MPEG transport stream is inputted to the ATS generation unit and the ATS multiplexing unit,

wherein the ATS generation unit detects a PCR value in the input MPEG transport stream, and outputs an Arrived Time Stamp (ATS) to the ATS multiplexing unit,

wherein the ATS multiplexing unit multiplexes the ATS ~~Arrived Time Stamp~~ and the input MPEG transport stream, and stores the multiplexed MPEG transport stream and ATS ~~data~~ in a storage medium,

wherein each of the channel reproduction units includes ~~each include~~ a PID filter, a buffer, a packet rewriting unit, an ATS detection unit, and a PTS·DTS detection unit,

wherein the PID filter extracts, from the storage medium, an ~~a~~ MPEG transport stream having a PID that is to be reproduced ~~from the storage medium~~, and outputs the extracted MPEG transport stream to the buffer and the PTS·DTS detection unit,

wherein the buffer outputs ~~a~~ the extracted MPEG transport stream to the packet rewriting unit in accordance with a control of the multiplexing unit,

wherein the packet rewriting unit rewrites a time that is indicated by an ATS counter[[,]] and ~~which~~ is outputted from the reproduction timing generation unit, as PCR, and outputs the rewritten PCR,

wherein the ATS detection unit reads an initial value of the ATS that is multiplexed ~~with-~~ ~~in~~ the extracted MPEG transport stream ~~that which~~ is extracted ~~read~~ from the storage medium, and outputs the initial value of the ATS to the reproduction ATS generation unit as an ATS initial value,

wherein the PTS·DTS detection unit detects PTS and DTS in the ~~input~~ extracted MPEG transport stream, and outputs values of the PTS and DTS ~~values~~ to the reproduction timing generation unit,

wherein the reproduction ATS generation unit selects one ~~of the~~ ATS initial value ~~values~~, corresponding to one channel, which is ~~are~~ inputted from the ATS detection unit of a channel reproduction unit, and outputs (i) a value of a counter, which uses the selected ATS initial value as an initial value, to the packet rewriting unit, the reproduction timing generation unit, and the multiplexing unit, ~~as well as outputs~~ and (ii) a difference between the selected ATS initial value corresponding to ~~of~~ the ~~selected~~ one channel, which is used as the initial value of the counter, and an ATS initial value of ~~other~~ another channel to the reproduction timing generation unit,

wherein the reproduction timing generation unit generates timing of multiplexing of ~~the~~ an MPEG transport stream that is outputted from ~~the~~ each channel reproduction unit, and outputs the generated timing to the multiplexing unit, ~~and~~

wherein the multiplexing unit multiplexes ~~the~~ MPEG transport streams that are outputted from ~~the~~ each channel reproduction unit in accordance with the multiplexing timing that is outputted from the reproduction timing generation unit, and outputs the multiplexed stream,

wherein a reproduction control signal for informing switching of video between arbitrary channels is inputted to the packet rewriting unit of each channel reproduction unit and the reproduction timing generation unit, and

wherein the reproduction timing generation unit generates a PTS and a DTS for correcting discontinuity in MPEG video streams resulting from the channel switching in accordance with the reproduction control signal, thereby correcting discontinuity other than that in the PTS and the DTS in the MPEG video streams resulting from the channel switching.

Claim 2 (Currently Amended) The image reproduction apparatus of Claim 1 wherein the reproduction timing generation unit generates a timing such that a reproduction time interval between a Presentation Time Stamp (PTS) and a Decoding Time Stamp (DTS) of an arbitrary video/audio channel, which are included in the ~~MPEG transport~~ multiplexed stream outputted from the multiplexing unit, becomes equal to a time interval between a PTS and a DTS in ~~a~~ an MPEG transport stream of ~~the~~ original images.

Claim 3 (Previously Presented) The image reproduction apparatus of Claim 1 wherein the packet rewriting unit further has a function of rewriting a stream, thereby controlling a buffer in a decoding apparatus.

Claim 4 (Currently Amended) The image reproduction apparatus of Claim 3 wherein the packet rewriting unit rewrites a stream by rewriting vbv_delay in ~~a~~ an MPEG video stream.

Claim 5 (Currently Amended) The image reproduction apparatus of Claim 3 wherein the packet rewriting unit further has a function of rewriting a coding parameter of a video/audio stream, and monitors a code amount of a video/audio stream in ~~a~~ an MPEG transport stream at the reproduction, thereby optimizing the code amount.

Claim 6 (Cancelled)

Claim 7 (Currently Amended) The image reproduction apparatus of Claim 1 wherein ~~a reproduction control signal for informing switching of video between arbitrary channels is inputted to the reproduction timing generation unit, and~~

the reproduction timing generation unit generates timing of multiplexing of MPEG transport streams for correcting discontinuity in ~~the~~ an Arrived Time Stamp resulting from the channel switching in accordance with the reproduction control signal.

Claim 8 (Currently Amended) ~~The image reproduction apparatus of Claim 1, wherein~~ An image reproduction apparatus including an ATS generation unit, an ATS multiplexing unit, channel reproduction units, a reproduction ATS generation unit, a reproduction timing generation unit, and a multiplexing unit,

wherein an MPEG transport stream is inputted to the ATS generation unit and the ATS multiplexing unit,

wherein the ATS generation unit detects a PCR value in the input MPEG transport stream, and outputs an Arrived Time Stamp (ATS) to the ATS multiplexing unit,

wherein the ATS multiplexing unit multiplexes the ATS and the input MPEG transport stream, and stores the multiplexed MPEG transport stream and ATS in a storage medium,

wherein each of the channel reproduction units includes a PID filter, a buffer, a packet rewriting unit, an ATS detection unit, and a PTS·DTS detection unit,

wherein the PID filter extracts, from the storage medium, an MPEG transport stream having a PID that is to be reproduced, and outputs the extracted MPEG transport stream to the buffer and the PTS·DTS detection unit,

wherein the buffer outputs the extracted MPEG transport stream to the packet rewriting unit in accordance with a control of the multiplexing unit,

wherein the packet rewriting unit rewrites a time that is indicated by an ATS counter and is outputted from the reproduction timing generation unit, as PCR, and outputs the rewritten PCR,

wherein the ATS detection unit reads an initial value of the ATS that is multiplexed with the extracted MPEG transport stream that is extracted from the storage medium, and outputs the initial value of the ATS to the reproduction ATS generation unit as an ATS initial value,

wherein the PTS·DTS detection unit detects PTS and DTS in the extracted MPEG transport stream, and outputs values of the PTS and DTS to the reproduction timing generation unit,

wherein the reproduction ATS generation unit selects one ATS initial value, corresponding to one channel, which is inputted from the ATS detection unit of a channel reproduction unit, and outputs (i) a value of a counter, which uses the selected ATS initial value

as an initial value, to the packet rewriting unit, the reproduction timing generation unit, and the multiplexing unit, and (ii) a difference between the selected ATS initial value corresponding to the one channel, which is used as the initial value of the counter, and an ATS initial value of another channel to the reproduction timing generation unit,

wherein the reproduction timing generation unit generates timing of multiplexing of an MPEG transport stream that is outputted from each channel reproduction unit, and outputs the generated timing to the multiplexing unit,

wherein the multiplexing unit multiplexes MPEG transport streams that are outputted from each channel reproduction unit in accordance with the multiplexing timing that is outputted from the reproduction timing generation unit, and outputs the multiplexed stream,

wherein a reproduction control signal for informing switching of video between arbitrary channels is inputted to the packet rewriting unit of each channel reproduction unit and the reproduction timing generation unit, and

wherein the reproduction timing generation unit has a function of generating a PTS and a DTS for correcting discontinuity in MPEG video streams resulting from the channel switching in accordance with the reproduction control signal, thereby correcting discontinuity other than that in the PTS and the DTS in the MPEG video streams resulting from the channel switching, ~~as well as has~~ and a function of generating timing of multiplexing of MPEG transport streams for correcting discontinuity in ~~the~~ Arrived Time Stamps resulting from the channel switching in accordance with the reproduction control signal.

Claim 9 (Currently Amended) The image reproduction apparatus of claim 1 ~~Claim 6~~ wherein the discontinuity other than that in the PTS and the DTS in the MPEG video streams resulting from the channel switching is discontinuity in Broken_link bits in the MPEG video streams.

Claim 10 (Currently Amended) The image reproduction apparatus of claim 1 ~~Claim 6~~ wherein the discontinuity other than that in the PTS and the DTS in the MPEG video streams resulting from the channel switching is discontinuity in Continuity_counter bits in the MPEG transport streams.

Claim 11 (Currently Amended) The image reproduction apparatus of claim 1 ~~Claim 6~~ wherein the packet rewriting unit rewrites a PID so as to prevent a change in a video/audio PID at a time when the channel switching is performed.

Claim 12 (Currently Amended) The image reproduction apparatus of claim 1 ~~Claim 6~~ wherein the packet rewriting unit outputs a dummy MPEG transport stream at the channel switching during a period from when an output of a video stream that is being reproduced stops and to when reproduction of ~~the~~ a next stream is started.

Claim 13 (Previously Presented) The image reproduction apparatus of Claim 12 wherein the dummy MPEG transport stream comprises pictures of a low bit rate.

Claim 14 (Previously Presented) The image reproduction apparatus of Claim 12 wherein the dummy MPEG transport stream comprises a picture that is required to decode a start picture of the next stream.

Claim 15 (Currently Amended) The image reproduction apparatus of Claim 12 wherein when the video stream is switched by the channel switching to a stream of a different time period in the same video stream, the dummy MPEG transport stream comprises arbitrary pictures between ~~the~~ a last picture in the video stream that is stopped by the channel switching and ~~the~~ a first picture in the video stream that will be reproduced next.

Claim 16 (Currently Amended) The image reproduction apparatus of Claim 12,

wherein the dummy MPEG transport stream comprises a picture that is required to decode a start picture of the next stream, or

wherein when the video stream is switched by the channel switching to a stream of a different time period in the same video stream, the dummy MPEG transport stream comprises arbitrary pictures between ~~the~~ a last picture of the video stream that is stopped by the channel switching and ~~the~~ a first picture of the video stream that will be reproduced next.

Claim 17 (Currently Amended) The image reproduction apparatus of Claim 1 further including[[:]] a trick-play control unit and a trick-play picture generation unit,

wherein the ~~said~~ trick-play control unit transmits ~~transmitting~~ a transmission band that is allocated to trick play and trick-play control information to the trick-play picture generation unit, and

wherein the ~~said~~ trick play picture generation unit generates ~~generating~~ trick-play video/audio on ~~the~~ a basis of outputs from the buffer using the transmission band and the control information which are transmitted from the trick-play control unit, and transmits ~~transmitting~~ the generated trick-play video/audio to the packet rewriting unit.

Claim 18 (Currently Amended) The image reproduction apparatus of Claim 17,

wherein the trick-play control unit changes the transmission band that is allocated to the trick play also in a period when the trick play is being performed, and

wherein the trick-play picture generation unit generates trick-play pictures on ~~the~~ a basis of the transmission band that is transmitted from the trick-play control unit.

Claim 19 (Currently Amended) The image reproduction apparatus of Claim 8 wherein the discontinuity other than that in the PTS and the DTS in the MPEG video streams resulting from the channel switching is discontinuity in Broken_link bits in the MPEG video streams.

Claim 20 (Currently Amended) The image reproduction apparatus of Claim 8 wherein the discontinuity other than that in the PTS and the DTS in the MPEG video streams resulting from the channel switching is discontinuity in Continuity_counter bits in the MPEG transport streams.

Claim 21 (Previously Presented) The image reproduction apparatus of Claim 8 wherein the packet rewriting unit rewrites a PID so as to prevent a change in a video/audio PID at a time when the channel switching is performed.

Claim 22 (Currently Amended) The image reproduction apparatus of Claim 8 wherein the packet rewriting unit outputs a dummy MPEG transport stream at the channel switching during a period from when an output of a video stream that is being reproduced stops and to when reproduction of ~~the~~ a next stream is started.